

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

REPLY TO:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

u **DUE ON** APR 13 2005 *15*

Date of mailing
(day/month/year) : see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/CA2004/000864

International filing date (day/month/year)
11.06.2004

Priority date (day/month/year)
13.06.2003

International Patent Classification (IPC) or both national classification and IPC
G06T17/10

Applicant
UNIVERSITE LAVAL

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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three 10 MAR months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later. 13 APR 2005

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

10/560130

International application No.
PCT/CA2004/000864

IAP8 Rec'd PCT/PTO 09 DEC 2005

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/000864

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1,2,6-10,30
Inventive step (IS)	Yes: Claims	
	No: Claims	11-13, 32, 33
Industrial applicability (IA)	Yes: Claims	1-33
	No: Claims	

2. Citations and explanations

see separate sheet

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Re. Section II (Priority)

1. For the time being it is assumed that the claimed priority is valid. This means that the document **D6** (see below) from the inventors of the present application is not pre-published prior art. **D6** is very similar to the application and would anticipate virtually all claims.

Re. Section V (Novelty and Inventive step)

2. The following documents are referred to in this communication; the numbering will be adhered to in the rest of the procedure:-

D1 ... D6: The documents of the International Search Report in the order as they are listed therein.

3. Although the claims 1, 11 and 13 have been drafted as separate independent method claims, they appear to relate effectively to effectively the same subject-matter; this being in particular true for claims 11 and 13. Moreover, the claims 11 and 13 seem to effectively contain additional features, as compared to claim 1, and could well be drafted as dependent claims.

The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

A full examination is deferred until a concise set of claims is filed. For procedural efficiency however the following preliminary statements are made.

4. Novelty:
 - 4.1 Document **D1** which also is from the present inventors seems to represent the closest prior art. **D1** discloses a method of incremental registration of range images for volume reconstruction.

Since claim 1 only recites the broad feature "three-dimensional entities" which clearly covers eg range images as discussed in D1, the claim 1 is anticipated by D1 (Art.33(2) PCT).

- 4.2 Another instance of prior art for registration of range images is document **D2** cited at page 4 of description. D2 also seems to read onto the broad claim 1.
- 4.3 Given the broad feature "three-dimensional entities" in claim 1, the claim seems to be further anticipated by document **D3** which primarily is concerned with reconstruction from unorganized points.
For this reason claim 2 is also anticipated by D3.

5. Claim 3: Obviousness vs clarity.
While it seems that the documents D1 to D3 do not disclose details of registration of curves for surface reconstruction, it is held that claim 3 is far too vague in this respect (Art.6 PCT). Or seeing it from another side, the mere notion of a "3D curve" in the claim is obvious in view of each of the documents **D1 to D3** (Art.33(3) PCT). In yet another approach, a combination with document D5 which is concerned with registration of profiles (curves) would also appear possible, rendering claim 3 obvious.

6. Claims 11 and 13.
No clear support for these claims has been found in the description, since these claims seem to relate to a method which definitely does not use curves, contrary to the statements at pages 1 to 17 of description (Art.6 PCT).
Regarding obviousness, it seems that the claims mainly differ from each of **D1, D2 or D3** in the feature "cost function" which as such is well known in the art and frequently used for optimisations, see eg **D4** (Art.33(3) PCT).

7. The applicant is therefore requested to file a new set of claims on which further examination is to be based. At the same time he should ensure that the claimed

**WRITTEN OPINION OF THE
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AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/CA2004/000864

subject-matter is sufficiently distinguished from that disclosed in the prior art, in particular D1.

- The statement of invention should be made consistent with the claims.

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